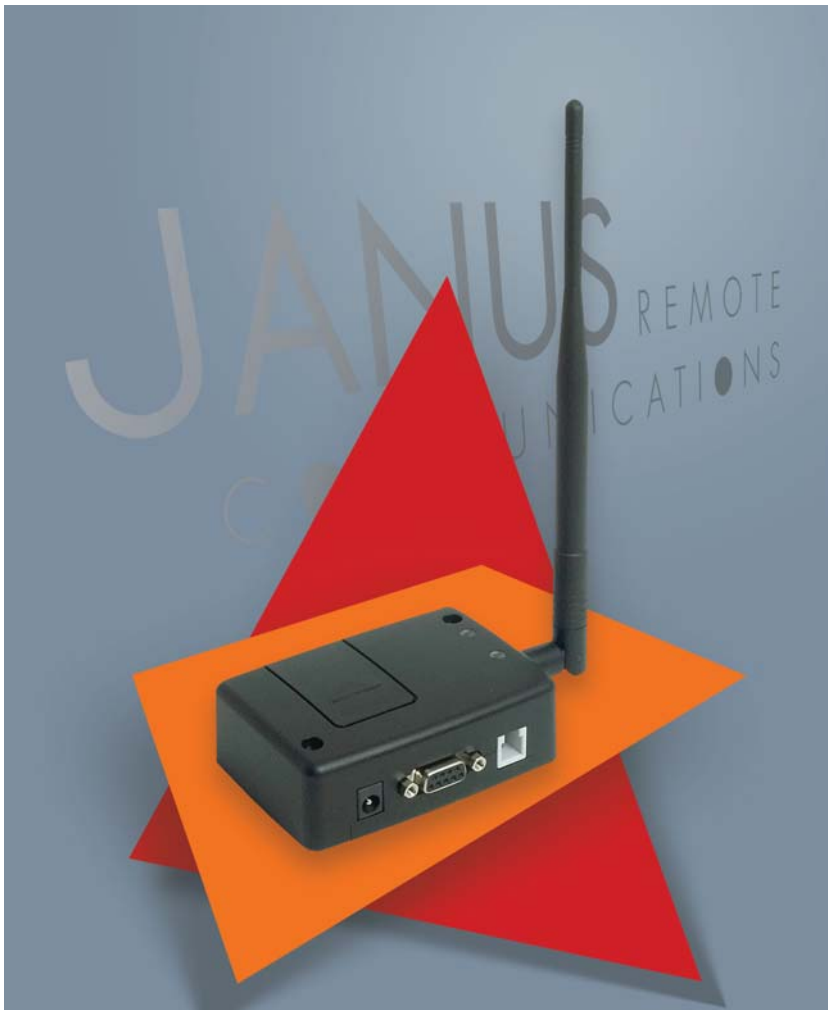
Terminus GSM864Q Hardware User Manual

Issue: R08



JANUS REMOTE COMMUNICATIONS

TABLE OF CONTENTS

TABLE OF CONTENTS 2-3

1 DISCLAIMER 3

2 REFERENCES 4

2.1 Telit Document List

2.2 Janus Document List

3 OVERVIEW 4-6

3.1 Introduction 4

3.2 Functional Description 4

3.2.1 Connectors 4

3.2.2 Block Diagram 5

3.3 Features 6

4 INTERFACES 7-14

4.1 Serial Interface Connector 7

4.1.1 Description

4.1.2 Pin-out

4.1.3 Signal Interface Description

4.2 Power Supply 8

4.2.1 Description

4.2.2 Pin-out

4.2.3 Power Supply Interface

4.3 Audio Interface 9

4.3.1 Description

4.3.2 Pin-out

4.3.3 Signal Description

4.4 Embedded Interface 10-12

4.4.1 Description

4.4.2 Pin-out

4.4.3 Signal Description

4.4.4 Signal Detail

4.4.4.1 General Purpose Input / Output

4.4.4.2 Analog to Digital Converter

4.4.4.3 Terminus Control

4.4.4.3.1 Reset Pin

4.4.4.4 ON/OFF Pin

4.4.4.5 PWRMON Pin

4.4.4.6 UART_SEL Pin

4.4.5 Terminus Control

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4 INTERFACES continued 7-14
4.5 LED Status Indicators
4.5.1 Description
4.5.2 GSM
4.5.3 GPS

4.6 RF Interface 13-14
4.6.1 Description
4.6.2 GSM Antenna
4.6.2.1 GSM Antenna Interface
4.6.2.2 GSM Antenna Specifications
4.6.2.3 GSM Antenna Installation Guidelines
4.6.3 GPS Antenna
4.6.3.1 GPS Antenna Interface
4.6.3.2 GPS Active Antenna Specifications
4.6.3.3 GPS Antenna Installation Guidelines

4.7 SIM Card Interface 14
4.7.1 Description
4.7.2 Additional details

5 TECHNICAL SPECIFICATIONS 15-17
5.1 Electrical Specifications 15-16
5.1.1 GSM Module Specifications
5.1.2 GPS Module Specifications
5.1.3 I/O Level Specifications

5.2 GC864Q Mechanical Dimensions 17

6. OPERATION 18-19
6.1 Setting Up a Terminus Emulator 18
6.2 Powering ON/OFF 18
6.3 Setting Up Network Services 18
6.4 Make a Voice Call 19
6.5 Making an SMS Call 19
6.6 Making a GPRS Data Call 19
6.7 Reference to documents 19

7 APPENDICES 20-22
7.1 Approvals
7.2 Safety
7.3 Abbreviations
7.4 Ordering Information
7.5 Revision History

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2 REFERENCES

2.1 Telit Document List

Please refer to Telit's website at ***www.telit.com*** for the latest information on the GC864 GSM module.

2.1.1 1vv0300733 GC864 Hardware User Guide

2.1.2 1vv0300740 GC864 Software User Guide

2.1.3 80000ST10025a AT Commands Reference Guide

2.1.4 80000ST10028 Easy GPRS User Guide

2.2 Janus Document List

Please refer to the Janus website, ***www.janus-rc.com***, for the latest product information on the Terminus and the CW20 GPS Module

2.2.1 NavSync CW20/CW20S GPS Receiver User Manual – Bulletin #NS25

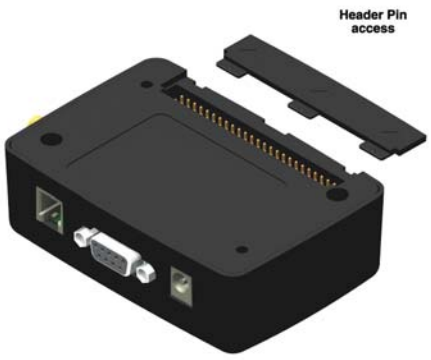
3 OVERVIEW

3.1 Introduction

The Terminus GSM864Q is a self-contained, quad-band GSM/GPRS terminal device designed to provide a comprehensive solution to application problems for our M2M customers. It utilizes the proven technology of the Telit® GC864-Quad module for its core communications engine as well as the NavSync CW20 module for the added flexibility of GPS.

3.2 Functional Description

3.2.1 Connectors



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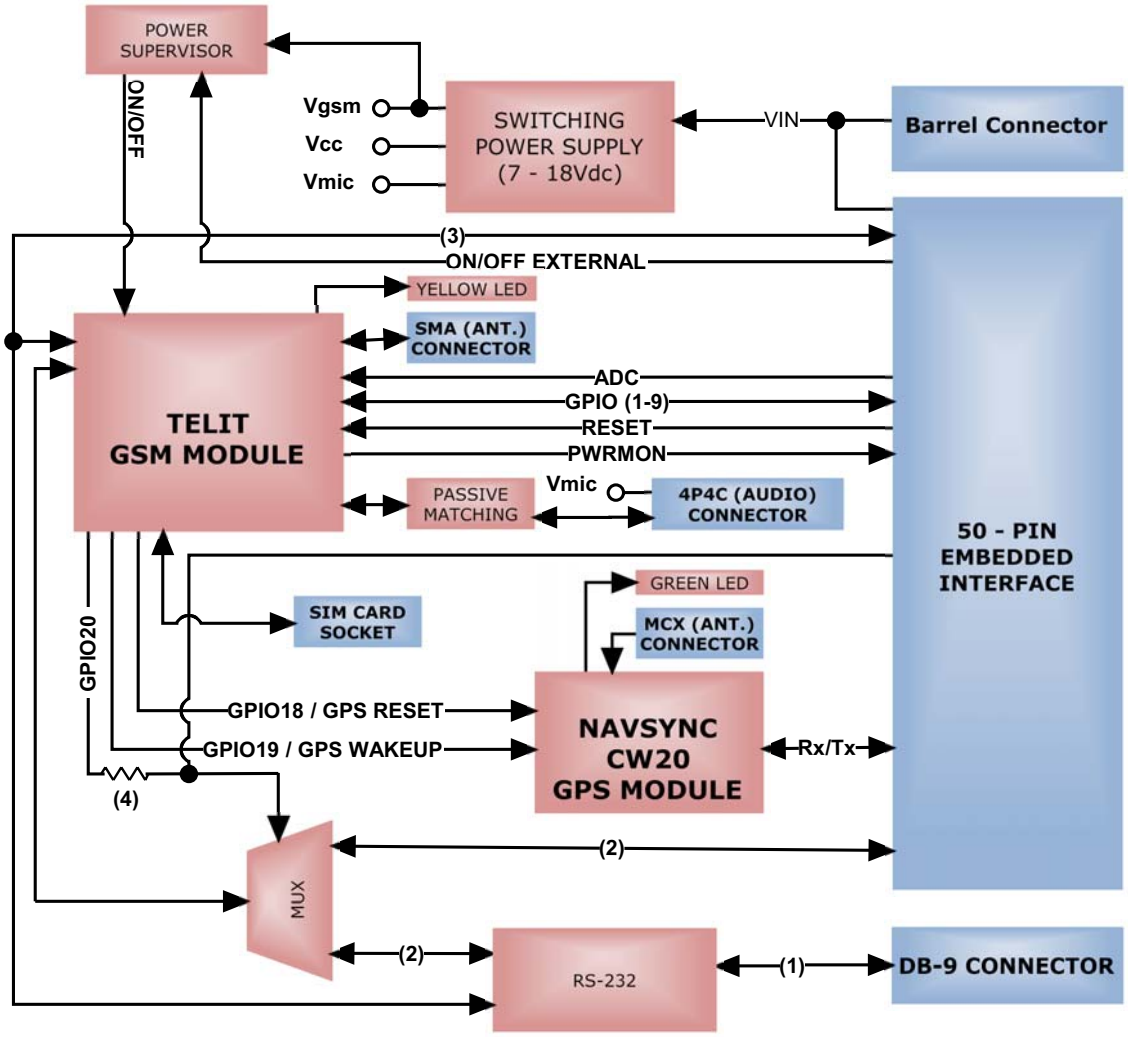
3.2.2 Block Diagram



Note:

1. *RS-232 Signals Include: RxD, TxD, CTS, RTS, DTR, DSR, RING, DCD*
2. *Only the RxD, TxD and RTS CMOS signals are MIXED between the 50-PIN and DB9 connector. All other UART connections are shared between the 50-PIN and DB9 connector. Hardware Handshaking signals can only be used if either the 50-PIN or DB9 connector is connected exclusively. Shared UART connections are all inputs so no I/O contention will occur.*
3. *CMOS Signals Include: CTS, DTR, DSR, RING, DCD.*
4. *Zero Ohm resistor placed only on Python enabled versions.*

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3.3 Terminus Features

3.3.1 GSM Features

Audio

- Telephony, Emergency
- Half rate, Full rate, Enhanced Full rate and Adaptive Multi Rate voice codecs (HR, FR, EFR, AMR)
- Superior Echo Cancellation & Noise Reduction
- Handset & Hands-free operations
- DTMF

Approvals

- Fully type approved according to R&TTE
- CE, GCF, FCC, PTCRB, IC

SMS

- Point-to-Point mobile originated and mobile terminal SMS
- Concatenated SMS supported
- SMS Cell Broadcast
- Text and PDU mode

Circuit Switched Data Transmission

- Asynchronous Transparent Circuit Switched Data (CSD) up to 14.4 kbps
- Asynchronous Non-transparent CSD up to 9.6 kbps
- V.110

GPRS Data

- GPRS Class 10
- Mobile station class B
- Coding Scheme 1 to 4
- PBCCH Support

Fax

- Group 3, Class 1

GSM Supplementary

- Call Forwarding
- Call Barring
- Call Waiting & Call Hold
- Advice of Charge
- Calling Line Identification Presentation (Clip)
- Calling Line Identification Restriction (CLIR)
- Unstructured Supplementary Services Mobile Originated Data (USSD)
- Closed User Group

Additional Features

- SIM Phonebook
- Fixed Dialing Number (FDN)
- Real Time Clock
- Alarm & Battery Management
- Network LED Support
- IRA Character Set
- Jamming Detection & Report
- Embedded TCP/IP Stack, including TP, IP, UDP, SMTP and FTP protocol

3.3.2 GPS Features (CW20)

- Delivers enhanced tracking to -152 dBm
- Low power consumption: 19mA fully active
- 16 Channel Receiver
- Supports WAAS/EGNOS

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4 INTERFACES

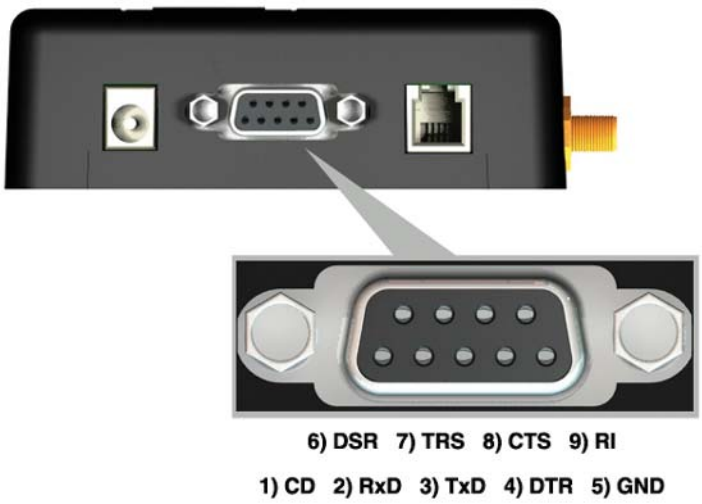
4.1 Serial Interface Connector

4.1.1 Description

The Terminus serial interface is an RS-232 port that supports both EIA/TIA-232 and V.28/V.24 communications protocols. It accepts a standard RS-232 Sub-D, 9-pin male plug. Communications settings for this port are as follows:

- Baud Rate: 115.2kbps
- Bits: 8
- Stop Bits: 1
- Parity: none
- Hardware Handshaking: Yes

4.1.2 Pin-Out



4.1.3 Signal Interface Description

Pin	Description	I/O	Signal Type
1	Carrier Detect (**CD**)	OUTPUT	RS-232
2	Received Data (**RxD**)	OUTPUT	RS-232
3	Transmitted Data (**TxD**)	INPUT	RS-232
4	DTE Ready (**DTR**)	INPUT	RS-232
5	Signal Ground	N/A	N/A
6	DCE Ready (**DSR**)	OUTPUT	RS-232
7	Request to Send (**RTS**)	INPUT	RS-232
8	Clear to Send (**CTS**)	OUTPUT	RS-232
9	Ring Indicator (**RI**)	OUTPUT	RS-232

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4 Interfaces continued

4.2 Power Supply

4.2.1 Description

The Terminus Power Supply jack accepts input voltages from 7 to 18 VDC (optionally 7 to 40 VDC for V3.00 and V4.00 models) and requires a nominal current sourcing capacity of 5W (maximum 10W). This jack accepts a barrel type plug with a receptacle for a 2.1mm center conductor.

4.2.2 Pin Out

4.2.3 Power Supply Interface

Pin	Description
Center Pin	Supply (+)
Outer Conductor	Supply (-)

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4 Interfaces continued

4.3 Audio Interface

4.3.1 Description

The Terminus audio interface is designed to accommodate a telephone handset with a 4P4C modular plug. The input circuit supports a balanced, low-impedance microphone and can supply a bias voltage of 3.0 VDC. Its characteristics are as follows:

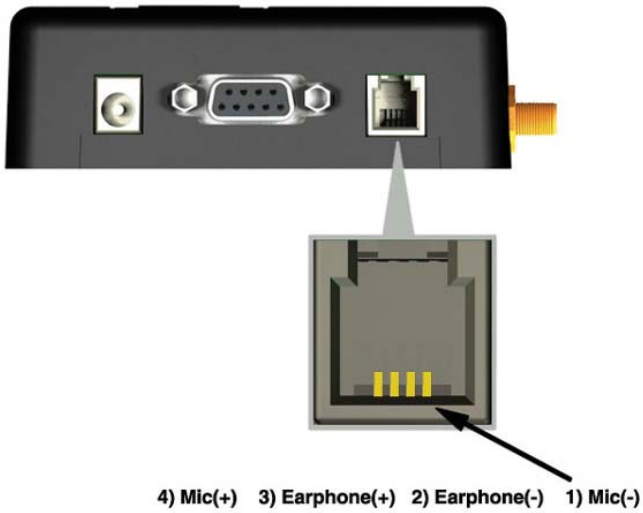
Audio Input Circuit (Mic)

- Line Coupling: AC
- Line Type: Balanced
- Coupling Capacitor: ≥100nF
- Differential Input Resistance: 50kΩ
- Differential Input Voltage: ≤1Vp-p (365Vrms)
- Nominal Input Sensitivity: -45 dBVrms/Pa

Audio Output Circuit (Earpiece or Speaker)

- Line Coupling: DC
- Line Type: Bridged
- Output Load Resistance: ≥14Ω
- Frequency Response: 150 – 4000 Hz @ -3dB
- Differential Output Voltage: 328mVrms/16Ω @ -12 dBFS
- Software Volume Control: -2dB/step, 10 steps total

4.3.2 Pin-Out



4.3.3 Signal Description

Pin	Description
1	Microphone (-)
2	Earphone (-)
3	Earphone (+)
4	Microphone (+), 3.0Vdc nominal supplied by Terminusto power handset.

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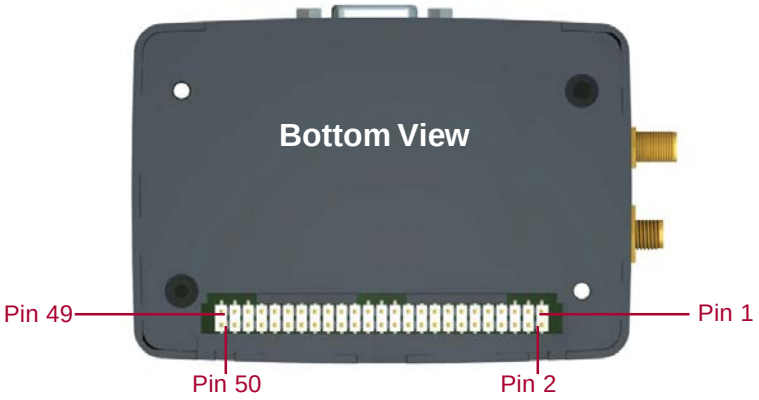
4.4 Embedded Interface

4.4.1 Description

The Embedded Interface is a 50 pin straight header that allows a user to access many of the available ports and features of the Terminus through a single interface. The connector is located on the bottom of the unit such that it can be integrated with an application PC board. A ribbon cable with a tabbed header connector such as the Samtec HCSD-25-D-1 can also be used. This interface can be functionally divided up into the following groups: General Purpose I/O interface, the ADC interface, Terminus Control interface and GPS Receiver interface. The pin designations and specifications for this interface are shown below.

4.4.2 Pin-Out



4.4.3 Signal Description

Pin	Description	I/O	Signal Type	Note
1	3.165 Vdc Output (*refer to* ***Supply Specification***)	OUTPUT	N/A	
3	RESET	INPUT	Internal Pull-up	
5	ON/OFF	INPUT	Internal Pull-up	1
7	PWRMON	OUTPUT	2.8V_CMOS	
9	UART_SEL	INPUT	2.8V_CMOS	
11	ADC1	INPUT	ANALOG	
13	GPIO1	BI-DIR	2.8V_CMOS	
15	GPIO2	BI-DIR	2.8V_CMOS	
17	GPIO3	BI-DIR	2.8V_CMOS	
19	GPIO4	BI-DIR	2.8V_CMOS	
21	GPIO5	BI-DIR	2.8V_CMOS	
23	GPIO6	BI-DIR	2.8V_CMOS	
25	GPIO7	BI-DIR	2.8V_CMOS	
27	GPIO8	BI-DIR	2.8V_CMOS	
29	GPIO9	BI-DIR	2.8V_CMOS	
31	DCE Ready (**DSR**)	OUTPUT	2.8V_CMOS	
33	Clear to Send (**CTS**)	OUTPUT	2.8V_CMOS	

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4.4.3 Signal Description continued

Pin	Description	I/O	Signal Type	Note
35	Ring Indicator (**RI**)	OUTPUT	2.8V_CMOS	
37	Carrier Detect (**CD**)	OUTPUT	2.8V_CMOS	
39	DTE Ready (**DTR**)	INPUT	2.8V_CMOS	
41	Request to Send (**RTS**)	INPUT	2.8V_CMOS	
43	GPS_RxD	INPUT	2.8V_CMOS	2
45	Received Data (**RxD**)	OUTPUT	2.8V_CMOS	
47	GPS_TxD	OUTPUT	2.8V_CMOS	2
49	Transmitted Data (**TxD**)	INPUT	2.8V_CMOS	
2,4,6,8	Supply (+) (7 - 18 VDC)	N/A	N/A	
10,12,14,16,18, 20,22,24,26,28, 30,32,34,36,38, 40,42,44,46,48,50	Supply (-) (GND)	N/A	N/A	

Notes:

1. It is recommended that this input be controlled by an Open Collector/Drain output. Do not use an external pull-up resistor, a pull-up is included internal to the Terminus.

2. This signal is only available by option, otherwise No Connection.

4.4.4 Signal Details

4.4.4.1 General Purpose Input / Output

Terminus GPIO are configurable as input, output, and special function. Configuration is controlled by the Customer specific application via AT commands send on the UART interface. The following table describes GPIO configuration options.

GPIO	Configuration	Alternate Function
1	Input / Output	
2	Input / Output	
3	Input / Output	
4	Input / Output	
5	Input / Output	RFTX monitor output
6	Input / Output	alarm output
7	Input / Output	buzzer output
8	Input / Output	
9	Input / Output	

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4.4.4 Signal Details continued

4.4.4.2 Analog to Digital Converter

ADC	Description
1	Analog to Digital Converter Input

4.4.4.3 Reset Pin

RESET PIN:

Input Logic State	Description
High-Z	Terminus Active State
0	Terminus Reset State

Notes:

1. *It is recommended that this input be controlled by an Open Collector/Drain output. Do not use an external pull-up resistor, a pull-up is included internal to the Terminus.*
2. *The RESET pin is offered as a means to reset the Terminus when and if the Terminus becomes unresponsive. The RESET pin is not intended to be used as a means of turning the Terminus off. Use the ON/OFF pin to turn the Terminus on or off.*
3. *RESET state must be held for at least 200ms before returning to active state.*

4.4.4.4 ON/OFF Pin

ON/OFF PIN:

Input Logic State	Description
High-Z	Terminus turned ON or OFF after Input returns to this state.
0	Toggle Terminus ON or OFF

Notes:

1. *It is recommended that this input be controlled by an Open Collector/Drain output. Do not use an external pull-up resistor, a pull-up is included internal to the Terminus.*
2. *The ON/OFF pin is offered as a means to power-on and power-down the Terminus. When the Terminus powers-down it informs the cell tower that it is powering down and will not be communicating with the tower any more. This is considered a controlled power-down.*
3. *After toggling the power state of the Terminus, wait until PWRMON indicates chosen state before toggling the power state again.*
4. *Optionally the Terminus may be powered-down with the use of AT commands.*

4.4.4.5 PWRMON Pin

PWRMON PIN:

Output Logic State	Description
0	Terminus powered-down
1	Terminus powered-on

Notes:

1. *Used in conjunction with ON/OFF pin to control power-on and power-down state.*

4.4.4.6 UART_SEL Pin

UART_SEL PIN:

Input Logic State	Description
1	Terminus UART interface routed to DB9 connector (RS-232)
0	Terminus UART interface routed to EMBEDDED connector (2.8V_CMOS)

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4.5 LED Status Indicators

4.5.1 Description

The LED Status Indicators are located on the top of the housing near the end where the antenna jacks are. There are 2 LED indicators; GSM Status and GPS Status.

4.5.2 GSM LED Status (Yellow)

LED Status	Device Status
Permanently Off	Device Off
Fast Blinking (0.5 sec on/0.5 sec off)	Net search/ Not registered/Turning Off
Slow Blinking (0.3 sec on/ 2.7 sec off)	Registered, Full Service
Permanently On	A call is active

4.5.3 GPS (Green)

LED Status	Device Status
Permanently Off	Device Off
Blinking	Receiver Activated

4.6 RF Interface

4.6.1 Description

There are two RF interfaces on the Terminus – the GSM antenna jack and the GPS antenna jack (the non-GPS version will only have one). The specifications and requirements for these are as follows:

4.6.2 GSM Antenna

4.6.2.1 GSM Antenna Interface:

Type:

SMA - FEMALE

Pin	Description
Center Pin	GSM Signal
Outer Conductor	SIGNAL Ground

4.6.2.2 GSM Antenna Specifications

Frequency range	Depending by frequency band(s) provided by the network operator, the customer shall use the most suitable antenna for that/those band(s)
Bandwidth	70 MHz in GSM850 80 MHz in GSM900 170 MHz in DCS 140 MHz PCS band
Gain	< 3dBi
Impedance	50 ohm
Input power	> 2 W peak power
VSWR (absolute max)	<= 10:1
VSWR (recommended)	<= 2:1

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4.6 RF Interface continued

4.6.2 GSM Antenna continued

4.6.2.3 GSM Antenna Installation Guidelines

1. Install the antenna in a place covered by the GSM signal.
2. The Antenna must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other transmitting antenna.
3. Antenna shall not be installed inside metal cases.
4. Antenna shall be installed according to manufacturer instructions.

4.6.3 GPS Antenna

4.6.3.1 GPS Antenna Interface

Type:

MCX - FEMALE

Pin	Description
Center Pin	GPS Signal, 3.7 Vdc nominal supplied from Terminus to power active antenna.
Outer Conductor	Signal ground

Note: GPS Antenna Interface only available by option, otherwise not populated.

4.6.3.2 GPS Active Antenna Specifications:

Input Voltage Range	3.4 to 4.2 Vdc
Frequency range	1575.42 ± 3 MHz
Gain	Depends on cable type and length
Impedance	50 ohm
VSWR	<= 1.5:1

Note: GPS Antenna Interface only available by option, otherwise GPS Antenna not required.

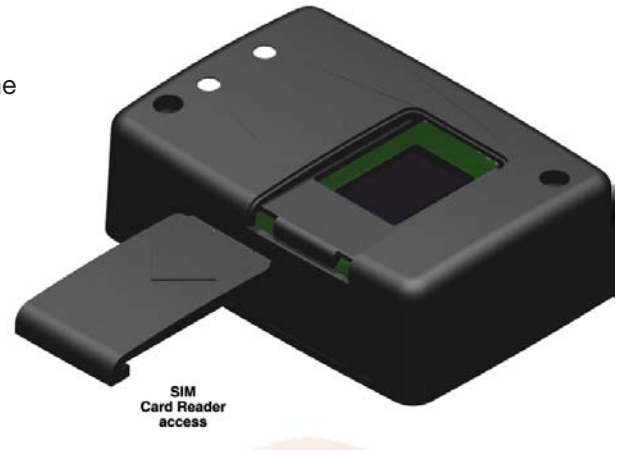
4.6.3.3 GPS Antenna Installation Guidelines

1. Install the antenna with a clear sky view.
2. Antenna shall not be installed inside metal cases.
3. Antenna shall be installed also according to Antenna manufacturer instructions.

4.7 SIM Card Interface

4.7.1 Description

The SIM Card Interface allows the Terminus to accept the subscriber card provided by the cellular telephone provider. It can accommodate a 1.8V or 3.0V SIM card and complies with the GSM 11.14 Phase 2 SIM Toolkit standard.



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5 TECHNICAL SPECIFICATIONS

5.1 Electrical Specifications

5.1.1 GSM Module Specification

- Quad-band EGSM 850 / 900 / 1800 / 1900 MHz
- Output Power: Class 4 [2W] @ 850 / 900 MHz, Class 1 [1W] @ 1800 / 1900 MHz
- Control via AT commands according to GSM 07.05, 07.07 and proprietary Telit
- Serial Port Multiplexer GSM 7.10
- TCP/IP stack access via AT commands
- Sensitivity: -107 dBm (type.) @ 850 / 900 MHz, -106 dBm (typ.) @ 1800 / 1900 MHz

5.1.2 GPS Module Specifications

GPS Channels	16		
Frequency	1575.42 MHz – L1 C/A Code		
TTFF Cold Start @ -135 dBm	46 seconds		1, 7
TTFF Warm Start @ -141 dBm	34 seconds		1, 7
TTFF Hot Start @ -141 dBm	5 seconds		1, 7
Re-acquisition time @ -147 dBm	<3 seconds		2
Acquisition Sensitivity (fix not available)	TTFF (Hot) with all signals at -138 dBm: 30 s TTFF (Hot) with all signals at -141 dBm: 41 s		3
Acquisition Sensitivity (fix available) (dBm)	-147 dBm		4
Tracking Sensitivity (dBm)	-150 dBm		5
Acquisition Sensitivity SBAS satellites (dBm)	-135 dBm -143 dBm		6
Static Accuracy (without SBAS)	50% Confidence (CEP) 95% Confidence	1.2 m 3.1 m	7
Static Accuracy (with SBAS)	50% Confidence (CEP) 95% Confidence	0.8 m 2.0 m	8
Maximum Horizontal Speed	515 m/s		9
Maximum Vertical Speed	15 m/s		10
Maximum Altitude	18 Km		11
Maximum Acceleration (g)	2 g		

Notes:

1. *These are RMS values*
2. *Maximum Sensitivity -147 dBm*
3. *Simulator Test, all signals at specified power level.*
4. *Estimated*
5. *Simulator Test, continuous fix with all signals at specified power level.*
6. *Simulator Test with signal at specified power level.*
7. *Open-sky, 24 hrs statistic, active antenna (signal range is between 30 to 49 dB/Hz).*
8. *Open sky, 24 hrs statistic, active antenna (EGNOS signal used).*
9. *Limited by International Traffic in Arms Regulation (ITAR)*
10. *Defined by navigation integrity check*
11. *Limited by International Traffic in Arms Regulation (ITAR)*

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5.1.3 I/O Level Specification

Absolute Maximum Ratings

Parameter	Min	Typ	Max	Unit	Note
VIN (DIGITAL INPUTS)	-0.3	-	+3.75V	Volt	
VIN (ANALOG INPUT)	-0.3	-	+3.00V	Volt	
Storage Temperature	-40	-	85	°C	
Supply (+) referenced to Supply(-)	0	-	24	V	1

Operation of the device at these or any other conditions beyond those listed under Recommended Operating Conditions is not implied. Exposure to Absolute Maximum Rating conditions for extended periods of time may affect device reliability.

Recommended Operating Conditions

Parameter	Min	Typ	Max	Unit	Note
Temperature	-10	-	55	°C	
Supply (+) referenced to Supply (-)	7	-	18V	Volt	1
3.165 VDC Output	3	-	3.3V	Volt	2

Recommended Operating Conditions - Interface levels (2.8V CMOS)

Parameter	Min	Typ	Max	Unit
Input Voltage High - Vih	2.1	-	3.3	Volt
Input Voltage Low - Vil	0	-	0.5	Volt
Output Voltage High - Voh	2.2	-	3.0	Volt
Output Voltage Low - Vol	0	-	0.35	Volt

Typical Current Source/Sink capability = 1mA/1uA

Recommended Operating Conditions - RESET pin

Parameter	Min	Typ	Max	Unit
Input Voltage High - Vih_rst	2.0	-	2.2	Volt
Input Voltage Low - Vil_rst	0	-	0.2	Volt

It is recommended that this input be controlled by an Open Collector/Drain output. Do not use an external pull-up resistor, a pull-up is included internal to the Terminus.

Recommended Operating Conditions - ADC1 pin

Parameter	Min	Typ	Max	Unit
Input Voltage Range	0	-	2	Volt
AD Conversion	-	-	11	Bits
Resolution	1	1	< 1	mV

5.1.4 Terminus Electrical Specifications

Power Supply	Min	Typ	Max	Unit	Note
Voltage Range	7	-	18	VDC	
Current (idle mode)	14	-	22	mA (typ)	3
Current (idle mode) with GPS	20	-	35	mA (typ)	3, 4
Power (max)			11.5	Watts	5

Note:
1. 7-40V Vin by option. Please contact a sales representative for more information about ordering Terminus with GPS option.
2. Max current draw of 25mA on the 3.165VDC output.
3. Registered on Network, No Traffic
4. Active antenna not connected.
5. Maximum power during GSM transmission (see Telit GC864 Hardware User Guide, Section 5.1 for more information)

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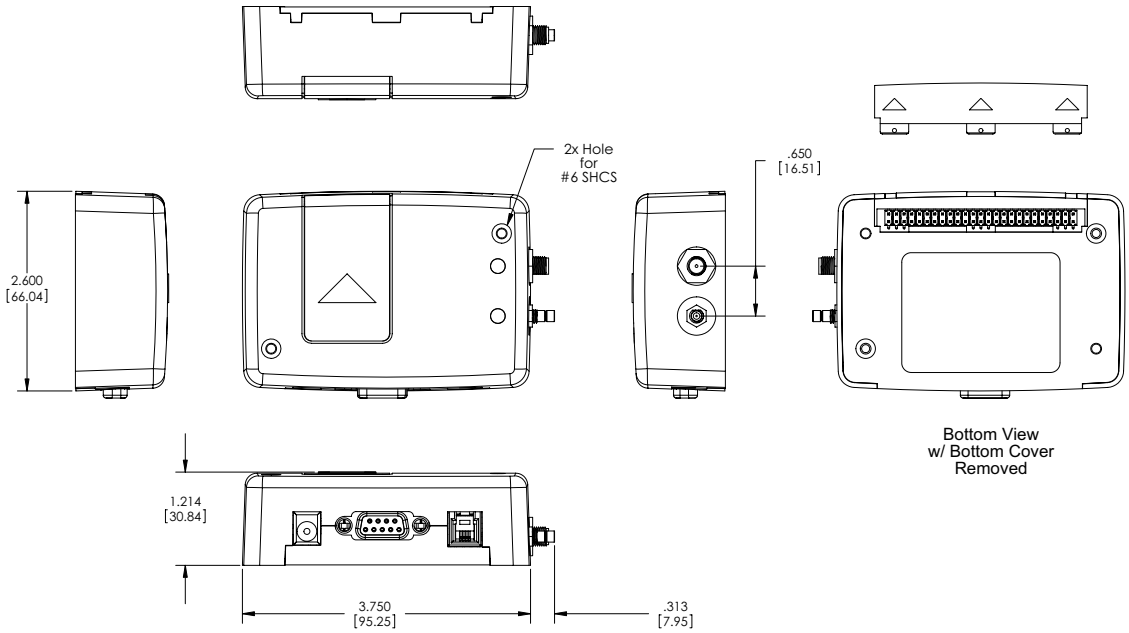
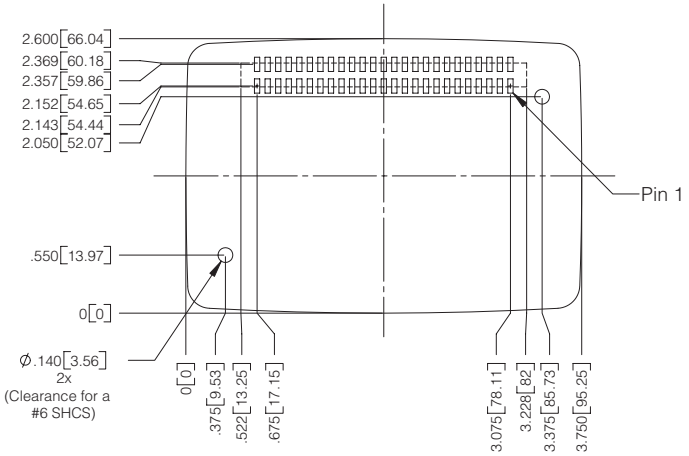
5 Technical Specifications continued

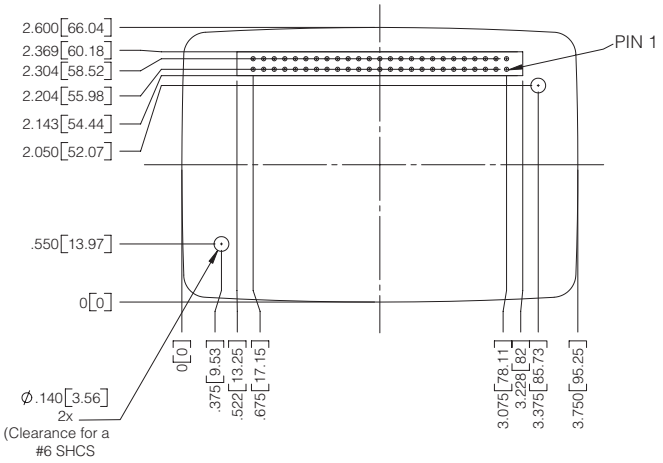
5.2.3 GC864Q Mechanical Dimensions



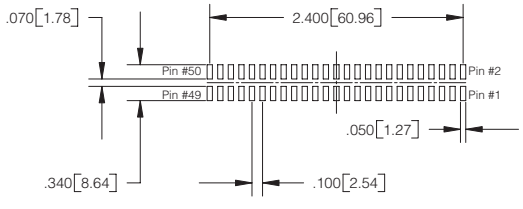
Mounting GC864Q Terminus in your application



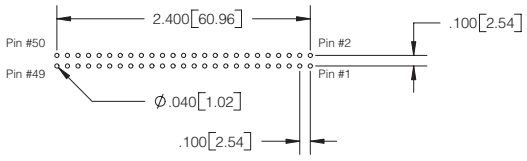
Mechanical Dimensions
(Top View)



Mechanical Dimensions
(Top View)



Pad Dimensions for
recomended connector,
Samtec P/N SSW-125-22-S-D-VS
(Top View)



Hole Dimensions for
recomended connector,
Samtec P/N SSQ-125-XX-X-D
(Top View)

Recommended Surface Mount Footprint

Recommended Thru-Hole Footprint

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6. OPERATION

6.1 Setting Up a Terminus Emulator

6.1.1 To interface with the Terminus connect the Serial Interface RS-232 port to a PC and use a terminal emulation program such as Microsoft® Hyperterminal. Set the interface parameters as follows:

- Baud Rate: 115.2 kbps
- Bits: 8
- Stop Bits: 1
- Parity: None
- Hardware Handshaking: Yes

6.1.2 Set Terminus to Auto-bauding

- Enter AT<cr> from terminal and wait for OK
- Enter AT+IPR=0<cr> and wait for OK
- Terminus is now set for auto data rate detection

6.2 Powering ON/Off

6.2.1 The Terminus is turned ON automatically once DC power is applied. If the Terminus is turned OFF using one of the methods described below, it can be turned back ON again through one of two methods:

- pull ON/OFF signal (pin 3 of 50 pin straight header) to ground, then release.
- press the ON/OFF switch, then release

The Terminus is fully operational after 4 seconds. Logging onto a network may take longer than this and is outside the control of the Terminus.

6.2.2 There are three ways to switch OFF the Terminus as described below.

- Use the appropriate AT command (AT#SHDN)
- Pull ON/OFF signal to ground, then release
- Press ON/OFF switch (SW1), then release

6.3 Setting Up Service – Network Settings

6.3.1 The network settings for the Terminus will vary depending on the cellular carrier you are using. Below are two of the North American Cases for these settings.

For T-mobile® & MNVO (Raco®, Sensor Logic®, Nexaira® Jasper Wireless®) enter:

AT#SELINT=2 //use of most recent AT command set
AT#STIA=2,10 or AT#STIA=1 // enable SAT – SIM Application Tool-Kit
AT#BND=3 // default bands to 850/1900
AT#AUTOBND=1 // enable Quad band system selection
AT#PLMNMODE=1 // enable EONS (enhanced operator naming scheme)
AT&P0 // save profile
AT&W0 // save setting

For AT&T/Cingular® & MNVO (Kore®, Aeris®, nPhase®) enter:

AT#SELINT=2 //use of most recent AT command set
AT#ENS=1 // AT&T/Cingular configuration
(SAT, BND, AUTONBND, PLMNMODE, plus Cingular® specific ENS requirements)

If Terminus is being used in a different country or with a different carrier please refer to Telit AT Command reference document regarding the use of the AT#BND command to set the proper frequency band).

Important: After entering either of the sets of settings above power the Terminus OFF and then ON. It is now ready for use.

6.3.2 Check network status (assuming you have a valid SIM card installed)

Enter AT+CREG? <cr> And wait for response

Response will be +CREG:0,1 or +CREG:1,1 meaning device is registered on its home network. If response is different than this please refer to the Telit AT Command Reference document for more information.

6.3.3 Check signal quality

Enter AT+CSQ<cr> And wait for response +CSQ:<rssi>,<ber>

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6. OPERATION continued

6.4 Making a Voice Call

6.4.1 Voice call mode allows you to use a telephone handset to communicate with a properly equipped subscriber unit.

- To set the call mode to voice enter AT+FCLASS=8<cr> and wait for response OK
- To set the audio path of the Terminus to internal (for handset use) enter AT#CAP=2
- To dial the phone number enter ATD <8885551234>; <cr>
- To disconnect the call enter ATH<cr>

6.5 Making an SMS Call

6.5.1 SMS (Select Message Service) mode allows you to send a text message (max 160 characters) to a SMS capable subscriber unit.

- To set the message mode to text enter AT+CMGF=1<cr>
- To enter the receiving subscriber unit phone number and message enter:
    1. AT+CMGS=<8885551234>
    2. Wait for response">" then enter message text
    3. Enter "ctrl z" <cr> to end message

6.6 Making a GPRS Data call

6.6.1 GPRS is a data service that uses Packet Data Protocol (PDP).

- To set up the PDP context parameters enter: AT+CGDCONT=1, "IP", "APN", "0.0.0.0",0,0<cr> where APN is specific to the service provider being used.
- Enter AT+CGQMIN=1,0,0,0,0,0
    1. This sets the minimum Quality of Service profile
- Enter AT+CGQREQ=1,0,0,3,0,0
    1. This sets up the desired Quality of Service profile
- Enter AT#SGACT=1,1,"v", "p" where v is your user ID and p is your password. If these are not set replace with "","""
    1. This activates the PDP context
- Enter AT#SD=1,0,IPA, "Port",0,0
    1. Look for response "CONNECT". This opens a remote connection via socket
    2. IPA = the IP address given to you by your service provider in the format:
        "xxx.xxx.xxx.xxx"
    3. 'Port'= the remote host port to contact provided by carrier (0 to 65535)
- **At this point a data session is active and data can be sent from the Terminus to the remote device and visa versa.**
    1. To exit the data session send the characters"+++" and wait for the OK response
- Enter AT#SH=1 to close the socket

6.7 Further Instructions

On utilizing different commands for other applications than those described here, please refer to the following documents:

Telit AT Commands Reference Guide
Telit GC864 Software User Guide
Telit Easy GPRS User Guide

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JANUS REMOTE COMMUNICATIONS

7 APPENDICES

7.1 Approvals

7.1.1 PTCRB Certification

The Terminus is PTCRB Certified; Lab: Cetecom, Inc.; Date: 7/27/2007

7.2 Safety Recommendations (for Information only)

7.2.1 General

Your Terminus GSM864Q (Terminus) terminal is based on the GSM standard for cellular technology. This standard is universal and covers Europe, Asia, United States and Africa which is the most used telecommunication standard.

Your Terminus is a low power radio transmitter and receiver. It sends out and receives radio frequency energy. When a GSM application is used, the cellular system that handles your calls controls both the radio frequency and the power level of your cellular wireless CPU®.

7.2.2 Exposure to RF Energy

There is public concern about possible health effects of using GSM terminals. Although past research on health effects from RF energy has focused on the current RF technology, scientists have begun researching newer radio technologies, such as GSM.

After existing research has been reviewed, and after compliance to all applicable safety standards has been tested, the conclusion is that the product is fit for use.

7.1.3 Antenna Care and Replacement

Do not use the Terminus with a damaged antenna. If a damaged antenna comes into contact with the skin, a minor burn may result. If you have a damaged antenna, refer to the instruction manual provided for proper procedures. Or, have your antenna repaired by a qualified technician.

Buy the antenna from an approved suppliers list. Using unauthorized antennas, modifications, or attachments could damage the Terminus and may violate local RF emission regulations or invalidate type approval.

7.3 Abbreviations

AC	**A**lternating **C**urrent
ADC	**A**nalog **T**o **D**igital **C**onverter
BER	**B**it **E**rror **R**ate
CD	**C**arrier **D**etect
CSD	**C**ircuit **S**witched **D**ata
CTS	**C**lear **T**o **S**end
DB	**D**eci**b**el
DBFS	**D**eci**b**els **F**ull **S**cale
DC	**D**irect **C**urrent
DCE	**D**ata **C**ommunications **E**quipment
DSR	**D**ata **S**et **R**eady
DTMF	**D**ual-**t**one **m**ulti-**f**requency
DTR	**DT**E **R**eady
EGNOS	**E**uropean **G**eostationary **N**avigation **O**verlay **S**ervice
FDN	**F**ixed **D**ialing **N**umber
GPIO	**G**eneral **P**urpose **I**nput **O**utput
GPRS	**G**eneral **P**acket **R**adio **S**ervice
GSM	**G**lobal **S**ystem **M**obile
ITAR	**I**nternational **T**raffic **I**n **A**rm **R**egulation
LED	**L**ight **E**mitting **D**iode
M2M	**M**achine To **M**achine
PBCCH	**P**acket **B**roadcast **C**ontrol **C**hannel
PDU	**P**rotocol **D**ata **U**nit
RF	**R**adio **F**requency
RI	**R**ing **I**ndicator
RSSI	**R**eceived **S**ignal **S**trength **I**ndication
RTS	**R**equest **T**o **S**end
RxD	**R**eceived **D**ata
SMS	**S**hort **M**essage **S**ervice
TTFF	**T**ime **T**o **F**irst **F**ix
TxD	**T**ransmitted **D**ata
USSD	**U**nstructured **S**upplementary **S**ervice **D**ata
VSWR	**V**oltage **S**tanding **W**ave **R**atio
WAAS	**W**ide **A**rea **A**ugmentation **S**ystem

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7. APPENDICES continued

7.4 Ordering Information

Ordering Information	Description
GSM864Q V1.00	Terminus GPS Terminal
GSM864Q V2.00	Terminus Non-GPS Terminal
GSM864Q V3.00	Terminus GPS Terminal HV
GSM864Q V4.00	Terminus Non-GPS Terminal HV
GSM864QP V1.00	Terminus GPS Terminal w/Python *
GSM864QP V2.00	Terminus Non-GPS Terminal w/Python *
GSM864QP V3.00	Terminus GPS Terminal HV w/Python *
GSM864QP V4.00	Terminus Non-GPS Terminal HV w/Python *

* Note disclaimer: The Python enabled terminals are not PTCRB or carrier certified

7.5 Revision History

Revision	Revision Date	Note
V 1.0	04/18/07	Preliminary Manual
V 2.0	06/26/07	Added Mechanical Drawings
V 3.0	06/28/07	Added Order Information & Spec Corrections
V 4.0	08/23/07	Updated Mechanical Drawings
V 5.0	10/23/07	Update Content and Additions
R06	02/18/08	Updated Block Diagram and Revision Control
R07	04/11/08	Pin-Out Correction
R08	07/23/07	Approvals, Abbreaviations, Revisions

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Terminus GSM864Q Hardware User Manual

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